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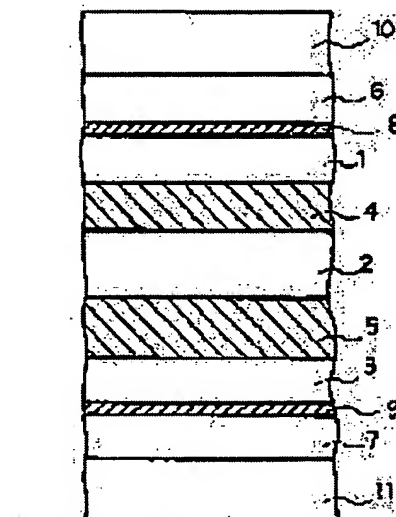(71)Applicant : **TOSHIBA CORP**

(72)Inventor : **KOUI KATSUHIKO**
IWASAKI HITOSHI
SAITO KAZUHIRO
FUKUYA HIROMI
FUKUZAWA HIDEAKI

(54) MAGNETO-RESISTIVE ELEMENT AND MAGNETIC RECORDER

(57)Abstract:

PROBLEM TO BE SOLVED: To prevent the magnetization inversion of magnetization fixation layers by electrostatic electric discharge and to improve the symmetricalness of output with respect to positive and negative magnetic fields by making the product of saturation magnetization, thicknesses and current magnetic fields nearly equal to each other between the first magnetization fixation layer and a first magnetization regulation layer and between the second magnetization fixation layer and the second magnetization regulation layer.
SOLUTION: The magnetization fixation layers 1, 3 fixed in the magnetization direction and a magnetization free layer 2 changed in the magnetization direction by the external magnetic fields are formed via nonmagnetic spacer layers 4, 5. The magnetization regulation layers 6, 7 are respectively formed via counterparallel bond layers 8, 9 on the magnetization fixation layers 1, 3. The magnetization thereof is coupled antiferromagnetically to the magnetization of the magnetization fixation layers 1, 3. The stability of the fixed magnetization in the case the magnetic fields are applied on the magnetization fixation layers 1, 3 is much higher than the stability of the case there are no magnetization regulation layers 6, 7. Exchange bias layers 10, 11 are coupled to the other side of the magnetization regulation layers 6, 7.

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